

Action. Therefore, an extension of time is not required.

Hereinafter, the claims that are pending prior to the entry of the amendments in this response are called "currently pending claims." This response cancels currently pending Claims 108 and 110; amends currently pending Claims 56-62, 65, 66, 69, 70, 75-80, 84, and 85-89; and adds new Claims 111-123. Upon amendment, the above-identified application will have one independent claim (amended Claim 56) and 64 total claims (amended Claims 56-62, currently pending Claims 63, and 64, amended Claims 65 and 66, currently pending Claims 67 and 68, amended Claims 69 and 70, currently pending Claims 71-74, amended Claims 75-80, currently pending Claims 81-83, amended Claims 84-89, currently pending Claims 90-96 and 98-107, and new Claims 111-123). The Applicants previously paid for up to three independent claims and up to 54 total claims. Therefore, a fee is due for ten excess total claims; and a check for this fee is enclosed herewith.

Amended Claims 56, 65, and 66 specify that x is an integer greater than or equal to 1 and that y is an integer greater than or equal to 2 in such a way that $x + y = 3, 4, 5, \text{ or } 6$. Support for specifying x and y as described in the preceding sentence can be found in, inter alia, originally filed Claim 1, which indicates that M is an actinide, which includes elements (such as uranium, neptunium, plutonium, and americium) that have oxidation states of 3+, 4+, 5+, or 6+.

Amended Claims 56, 57, 65, 66, 75, and 84 specify that each R optionally contains a heteroatom selected from the group consisting of boron, germanium, tin, lead, and elements from groups 15 and 16 of the periodic table of the elements. Support for specifying R as described in the preceding sentence can be found in, inter alia, originally filed Claim 1, which specifies that R optionally contains a heteroatom selected from boron and

groups 14 through 16 of the periodic table of the elements. Please note that group 14 includes germanium, tin, and lead.

Support for the other amendments to currently pending Claim 56 can be found in, inter alia, originally filed Claim 1.

Support for amending currently pending Claims 61, 79, 80, 88, and 89 to specify the definition of R^1 can be found in, inter alia, originally filed Claim 2.

Support for calling for a cocatalyst in amended Claim 65 can be found in, inter alia, lines 7-12 and 18-20 on page 6 of the specification and originally filed Claims 10 and 12.

Support for calling for a cocatalyst in amended Claim 66 can be found in, inter alia, lines 13-20 on page 6 of the specification and originally filed Claims 11 and 12.

Support for the other amendments to currently pending Claims 65 and 66 can be found in, inter alia, originally filed Claim 1.

This response amends currently pending Claim 70 merely to change the dependency of this claim.

New Claim 111 specifies that Q is selected from the group consisting of boron, carbon, germanium, tin, lead, and elements from group 16 of the periodic table. Support for specifying Q as described in the preceding sentence can be found in, inter alia, originally filed Claim 1, which specifies that Q is selected from boron and groups 14 and 16 of the periodic table. Please note that group 14 includes carbon, germanium, tin, and lead.

Support for new Claims 112 and 113 can be found in, inter alia,

originally filed Claim 1.

Support for new Claims 114 and 115 can be found in, inter alia, lines 7-18 on page 6 of the specification and originally filed Claims 10 and 11. Support for calling for a cocatalyst in a polymerization medium in amended Claims 114 and 115 can be found in, inter alia, Examples 11-15 on pages 13-14 of the specification.

Support for new Claim 116 can be found in, inter alia, originally filed Claim 16.

Support for new Claims 117-120 can be found in, inter alia, originally filed Claim 1.

Support for new Claims 121-123 can be found in, inter alia, lines 16-18 on page 2 of the specification, lines 4-6 on page 8 of the specification, Figure IV, and originally filed Claims 1 and 2 (e.g., see formulas I and II in originally filed Claim 1 and the definition of R in originally filed Claims 1 and 2).

Support for the other claim amendments can be found in, inter alia, originally filed Claim 1.

Amended Claims 56-62, currently pending Claims 63, and 64, amended Claims 65 and 66, currently pending Claims 67 and 68, amended Claims 69 and 70, currently pending Claims 71-74, amended Claims 75-80, currently pending Claims 81-83, amended Claims 84-89, currently pending Claims 90-93, and new Claims 111-115 and 117-123 are readable upon the elected invention. If elected amended Claim 56 is allowable, then the Examiner should consider on the merits nonelected currently pending Claims 94-96 and 98-107 and new Claim 116 because each of these claims is directly or indirectly dependent on an allowable base claim (amended Claim 56).

In item 2 of the outstanding Office Action, the Examiner objects to Figure II. This objection is now moot and should be withdrawn because this response amends Figure II.

In item 3 of the outstanding Office Action, the Examiner rejects currently pending Claims 56-93, 108, and 110 for allegedly being indefinite. This rejection is now moot and should be withdrawn because amended Claims 56-62, currently pending Claims 63, and 64, amended Claims 65 and 66, currently pending Claims 67 and 68, amended Claims 69 and 70, currently pending Claims 71-74, amended Claims 75-80, currently pending Claims 81-83, amended Claims 84-89, currently pending Claims 90-96 and 98-107, and new Claims 111-123 are not indefinite.

In items 4-7 of the outstanding Office Action, the Examiner rejects the currently pending claims for allegedly being anticipated by or obvious in view of the cited documents. The Applicants respectfully traverse this rejection because, as explained below, amended Claims 56-62, currently pending Claims 63, and 64, amended Claims 65 and 66, currently pending Claims 67 and 68, amended Claims 69 and 70, currently pending Claims 71-74, amended Claims 75-80, currently pending Claims 81-83, amended Claims 84-89, currently pending Claims 90-96 and 98-107, and new Claims 111-123 are not anticipated by or obvious view of the cited documents.

Amended Claim 56 claims a catalyst comprising a cocatalyst and a metallocene complex supported on a support, wherein the metallocene complex is supported on the support by means of a bond resulting from a reaction of the OSiR_3 group of the metallocene complex with a reactive group on a surface of the support, wherein the R group that contains the OSiR_3 group is directly bonded to Q

or to a cyclopentadienyl ring that optionally is fused with one or more other rings, wherein the OSiR''_3 group is not directly bonded to Q when Q contains Si. As a result, for the catalyst that is claimed in amended Claim 56, the bond between the support and the cyclopentadienyl ring may be illustrated as follows:

[Support with optional silicon atom]-Oxygen-[nonsilicon spacer]-[cyclopentadienyl ring].

Thus, the catalyst claimed in amended Claim 56 may be described as having a cyclopentadienyl ring bonded to a support by means of an oxygen atom and a nonsilicon spacer. Consequently, henceforth, the catalyst claimed in Claim 56 will be described as having an "oxygen/nonsilicon bridge."

This oxygen/nonsilicon bridge is important because it improves the efficacy of the claimed catalyst in homopolymerization and copolymerization of olefins. Indeed, amended Claim 56 is novel and nonobvious over the prior art because the prior art does not teach or suggest the claimed catalyst, wherein the claimed cyclopentadienyl is bonded to the support by an oxygen/nonsilicon bridge.

For example, Vega et al.'s U.S. Patent No. 5,824,620 discloses (see lines 3-25 in column 5, lines 22-43 in column 2, and Examples 7 and 8 in column 8) a catalyst comprising a cyclopentadienyl ring bonded to a modified support by an -O-[optional spacer]-Si-bridge, not an oxygen/nonsilicon bridge. Specifically, lines 3-25 in column 5, lines 22-43 in column 2, and Examples 7 and 8 disclose a catalyst that may be illustrated as follows:

[Support]-O-[optional spacer]-Si-[cyclopentadienyl ring].

The Vega patent also discloses a catalyst comprising a cyclopentadienyl ring bonded to a nonmodified support. However, the Vega patent does not teach or suggest that the cyclopentadienyl ring may be bonded to the nonmodified support by an oxygen/nonsilicon bridge, as called for in amended Claim 56. Instead, all of the examples in the Vega patent (see Examples 3-6 in columns 7 and 8) that involve a nonmodified support teach that a catalyst comprising a cyclopentadienyl ring may be bonded to the nonmodified support by an -O-Si- bridge, not an oxygen/nonsilicon bridge as called for in amended Claim 56. Specifically, Examples 3-6 disclose a catalyst that may be illustrated as follows:

[Support]-O-Si-[cyclopentadienyl ring].

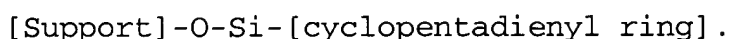
Similarly, Gila et al.'s U.S. Patent No. 5,846,895 (see column 4, line 1 through column 5, line 6) discloses a catalyst comprising a cyclopentadienyl ring bonded to a support by an -O-Si- bridge, not by an oxygen/nonsilicon bridge as called for in amended Claim 56. Specifically, Gila et al.'s U.S. Patent No. 5,846,895 discloses a catalyst that may be illustrated as follows:

[Support]-O-Si-[cyclopentadienyl ring].

Significantly, Gila et al.'s U.S. Patent No. 5,846,895 does not teach or suggest a catalyst comprising a cyclopentadienyl ring bonded to a support by an oxygen/nonsilicon bridge, as called for in amended Claim 56.

Antberg et al.'s U.S. Patent No. 5,202,398 (see column 5, lines 35-46) also discloses a catalyst comprising a cyclopentadienyl ring bonded to a support by an -O-Si- bridge, not by an

oxygen/nonsilicon bridge as called for in amended Claim 56. Specifically, the Antberg patent discloses a catalyst that may be illustrated as follows:



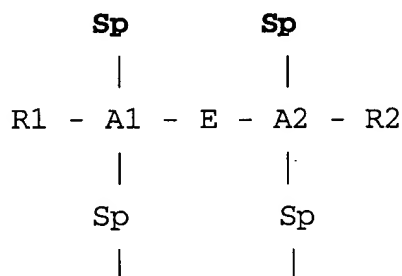
More importantly, the Antberg patent does not teach or suggest a catalyst comprising a cyclopentadienyl ring bonded to a support by an oxygen/nonsilicon bridge, as called for in amended Claim 56.

Similarly, Patsidis et al.'s U.S. Patent No. 5,466,766 (see column 3, lines 6-26), Gila et al.'s U.S. Patent No. 5,861,352 (see column 3, line 62 through column 4, line 24), and Huh et al.'s U.S. Patent No. 5,986,025 (column 3, line 22 through column 4, line 24) do not teach or suggest a catalyst comprising a cyclopentadienyl ring bonded to a support by an oxygen/nonsilicon bridge, as called for in amended Claim 56.

For example, the bridges that are disclosed in the Patsidis patent and in Gila et al.'s U.S. Patent No. 5,861,352 do not appear to contain oxygen at all. Furthermore, the Patsidis patent and Gila et al.'s U.S. Patent No. 5,861,352 do not teach or suggest a catalyst comprising a cyclopentadienyl ring bonded to a support by an oxygen/nonsilicon bridge, as called for in amended Claim 56.

The Huh patent also does not disclose a catalyst comprising a cyclopentadienyl ring bonded to a support by an oxygen/nonsilicon bridge, as called for in amended Claim 56. Instead, the Huh patent (line 40 of column 3 through line 24 of column 4) discloses

a bridge having the following ladder structure (hereinafter referred to as the "ladder bridge"):



Amended Claim 56 is novel and nonobvious over the Huh patent because amended Claim 56 calls for a catalyst comprising a cyclopentadienyl ring that is optionally fused with one or more other rings and that is bonded to a support by an oxygen/nonsilicon bridge, wherein the oxygen/nonsilicon bridge is structurally very different from Huh's ladder bridge. For example, Huh's ladder bridge includes two spacer groups that are illustrated above in boldface and that are not found in the oxygen/nonsilicon bridge of the Applicants' claimed catalyst.

As explained above, the Vega patent, Gila et al.'s U.S. Patent No. 5,864,895, the Antberg patent, the Patsidis patent, Gila et al.'s U.S. Patent No. 5,864,895, and the Huh patent do not teach or suggest the catalyst (with the oxygen/nonsilicon bridge) that is claimed in amended Claim 56. Consequently, amended Claim 56 is novel and nonobvious over the prior art and should be allowed.

All of the other claims (amended Subclaims 56-62, currently pending Subclaims 63, and 64, amended Subclaims 65 and 66, currently pending Subclaims 67 and 68, amended Subclaims 69 and 70, currently pending Subclaims 71-74, amended Subclaims 75-80, currently pending Subclaims 81-83, amended Subclaims 84-89, currently pending Subclaims 90-96 and 98-107, and new Subclaims

111-123) are nonobvious over the prior art because all of these subclaims are each directly or indirectly dependent on a nonobvious base claim (amended Claim 56). Furthermore, all of these subclaims are further nonobvious over the prior art because the prior art does not teach or suggest the particular features that are claimed in these subclaims. For example, the prior art does not teach or suggest a catalyst having the features that are claimed in new Subclaims 111-113 and 117-123.

It is submitted that the application is in condition for allowance. Allowance of the application at an early date is solicited.

This response cancels currently pending Claims 108 and 110; amends currently pending Claims 56-62, 65, 66, 69, 70, 75-80, 84, and 85-89; and adds new Claims 111-123. The cancellations, amendments, and additions that are described in the preceding sentence were done to improve the wording of the claims and/or to more fully claim the Applicants' invention and were not done to overcome the prior art, were not done to overcome rejections under 35 U.S.C. § 112, and were not done to overcome any other rejections or objections. The cancellations, amendments, and additions that are described in the first sentence of this paragraph shall not be considered necessary to overcome the prior art, shall not be considered necessary to overcome rejections under 35 U.S.C. § 112, and shall not be considered necessary to overcome any other rejections or objections.

The Applicants reserve the right to seek protection for any unclaimed subject matter either subsequently in the prosecution of the present case or in a divisional or continuation application.

The Commissioner is authorized to charge any additional fees which may be required or credit overpayment to Deposit Account No. 12-

0415. In particular, if this response is not timely filed, then the Commissioner is authorized to treat this Response as including a petition to extend the time period pursuant to 37 C.F.R 1.136 (A) requesting an extension of time of the number of months necessary to make this response timely filed; and the petition fee due in connection therewith may be charged to deposit account No. 12-0415.

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first-class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C., 20231 on


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(Date of Deposit)

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